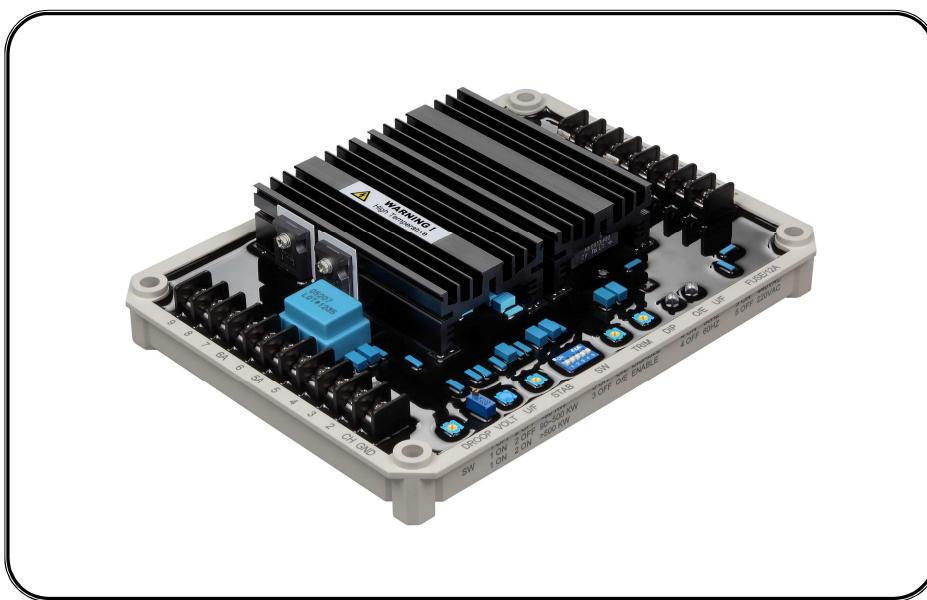


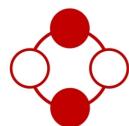
ADVR-12

Universal Hybrid Analog-Digital Voltage Regulator Operation Manual



Self Excited Automatic Voltage Regulator
For use in Brushless SHUNT, PMG and Auxiliary Winding
Compatible with Basler* AVC63-12, AVC125-10, CATERPILLAR*
VR6, Kato* K65-12B & K125-10B, Leroy Somer* 202-8634 regulators

* Used for reference purposes only and does not imply that any part listed above is the product of the manufacturer.



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SECTION 1 : SPECIFICATION

Sensing Input (20, 22, 24)

Voltage	220 – 520 Vac
	1- or 3- phase selectable
	180 – 260 Vac @ 220 Vac
	330 – 520 Vac @ 440 Vac
Frequency	50 / 60 Hz selectable

Power Input (26, 28, 30)

Voltage	60 – 300 Vac, 1 or 3 phase
Frequency	40 – 500 Hz

Output (F1, F2)

Voltage	63 Vdc @ power input 110 Vac 1 Phase
	75 Vdc @ power input 110 Vac 3 Phase
	125 Vdc @ power input 220 Vac 1 Phase
	150 Vdc @ power input 220 Vac 3 Phase
Current	Continuous 12A
	Intermittent 20A for 10 sec.
Resistance	≥ 5 ohms @ power input 110 Vac
	≥ 11 ohms @ power input 220 Vac
Fuse Spec.	6.3 x 32mm 12.5A / 500V (slow blow type)

Burden in SHUNT & PMG Wiring

1320 VA @ power input 110 Vac
2640 VA @ power input 220 Vac

Voltage Regulation

< +/- 0.5% (with 4% engine governing)

Typical System Response

AVR response 20ms

Build Up Voltage

Residual voltage at AVR power input terminal
> 6 Vac @ 25 Hz

Thermal Drift

0.03% per °C change in AVR ambient

External Voltage Adjustment

10K ohms 1 watt potentiometer

Soft Start Ramp Time

4 sec.

Unit Power Dissipation

Max.12 watts

EMI Suppression

Internal EMI filtering

Quadrature Droop Input (C1, C2)

CT 1A / 5A Max. +/- 5% @ P.F +/- 0.7
Input > 5VA

Analogue Input (2, 3)

Un 0 – 10% @ 0 – 10 Vdc or +/- 5 Vdc

Over Excitation Protection

Inverse-time 125 +/- 5 Vdc @ power input 220 Vac

Under Frequency Protection (Factory Knee Point Setting)

50 Hz system presets knee point at 47 Hz
60 Hz system presets knee point at 57 Hz
Knee point Frequency Drift : 0.1 Hz @ -40 - +70 °C

Environment

Operating Temperature	-40 – +70 °C
Storage Temperature	-40 – +85 °C
Relative Humidity	Max. 95%
Vibration	3 Gs @ 100 – 2K Hz

Dimensions

214.0 (L) x 163.0 (W) x 45.7 (H) mm

Weight

1130 g +/- 2%

SECTION 2 : FIGURE / SIZE REFERENCE

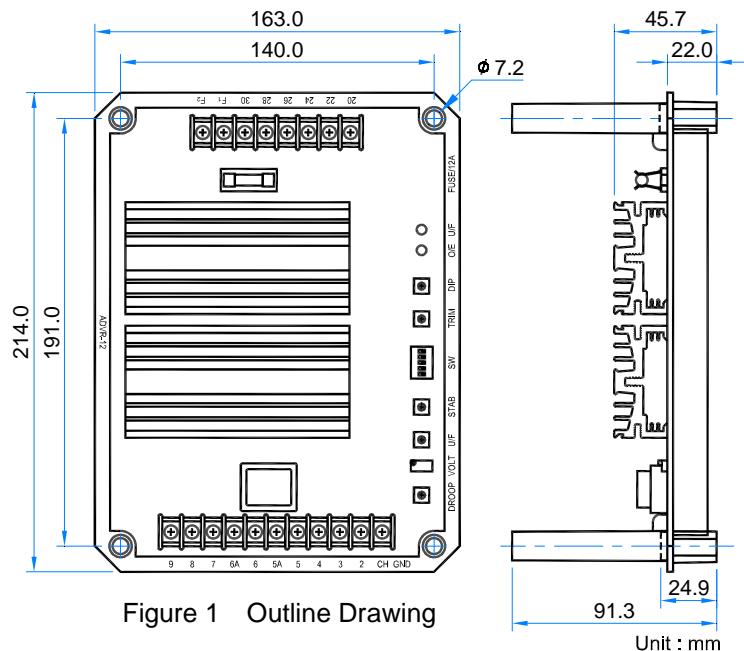


Figure 1 Outline Drawing

ATTENTION

1. AVR can be mounted directly on the engine, genset, switchgear, control panel, or any position that will not affect operation. For dimension reference please see Figure 1.
2. All voltage readings should be taken with an average-reading voltmeter. Megger or high-potential test equipment must not be used. Use of such equipment could damage the AVR.
3. Secure all wiring connections. Do not install AVR in a high vibration area to avoid loose connections. For safety do not touch the heat sink while in operation.

SECTION 3 : DIP SWITCH PROGRAMMING & ADJUSTMENTS

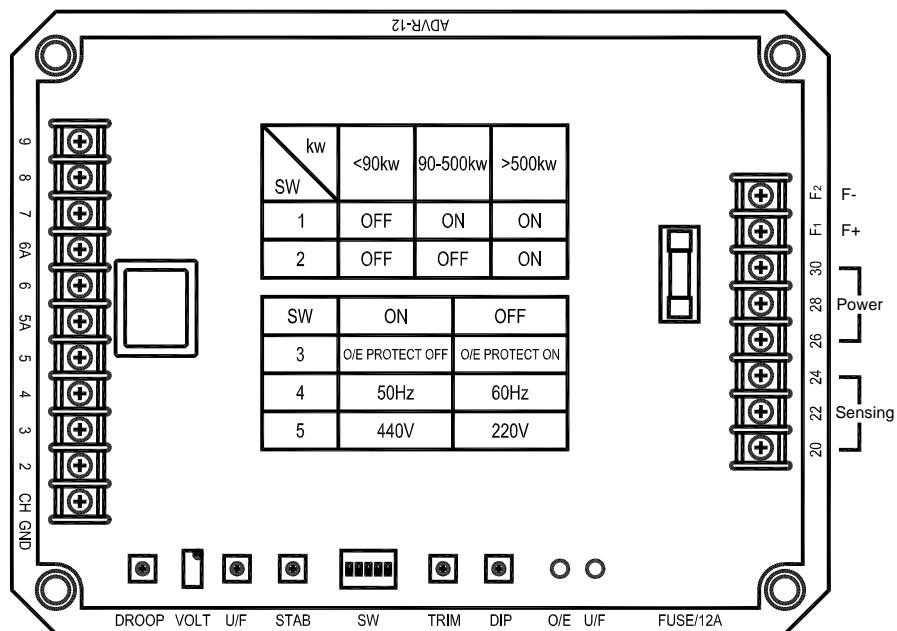


Figure 2

3.1 DROOP Adjustment (DROOP)

When operating in parallel the AVR increases or decreases its voltage output when phase current leads or lag the voltage. The range of this increase or decrease can be preset by the DROOP adjustment.

3.2 Voltage Adjustment (VOLT)

Generator rated output voltage adjustment. Must be in agreement with the DIP Switch SW5 voltage range setting.

180 – 260 Vac @ 220 Vac SW5 OFF
330 – 520 Vac @ 440 Vac SW5 ON

3.3 Under Frequency Adjustment (U/F)

When generator RPM falls below the knee point, the under frequency protection circuit will activate and the voltage and frequency begin to decrease in linear descend.

Select frequency 50 Hz or 60 Hz according to the generator in use.

3.4 Stability Adjustment (STAB)

Correct adjustment of STAB setting must be conducted while the generator is operating without load. First adjust the STAB potentiometer (POT) clockwise to the point the voltage becomes unstable, then adjust it back slightly, anti-clockwise (About 1/5 turn). This is point the voltage just reaches the critical point (Knee point) of stabilization, where the voltage is stable yet very close to becoming unstable.

3.5 TRIM Adjustment (TRIM)

When terminals 2 & 3 are biased with a DC voltage (-5 – +5V), the TRIM is used to adjust the influence this DC has on the output voltage of the AVR. If the TRIM (POT) is adjusted fully counter-clockwise the AVR DC output will not be influenced by any bias voltage. Conversely, if the TRIM is adjusted fully clockwise, then any signal will produce the maximum 10% effect.

3.6 U/F DIP Adjustment (DIP)

When U/F protection is activated-, the voltage droop ratio can be adjusted via the DIP VR. The adjustable range is 3 – 10 V/Hz.

3.7 Over Excitation LED (O/E)

Indicator illuminates when the generator is in Over-Excitation protection.

3.8 Under Frequency Protection LED (U/F)

Indicator illuminates when the generator is in U/F Under-Frequency protection.

SECTION 4 : CONNECTION TERMINAL

TERMINAL	DESCRIPTION
CH GND	Ground
2	Analogue Voltage Input
3	
4	Connect 4 & 7 for onboard voltage adjustment. Connect 10K ohm VR to 6a & 7 for external voltage adjustment. (keep 4 & 7 Open)
5	Current Transformer (CT) 1A input
5a	Current Transformer (CT) 5A input
6	Current Transformer (CT) common
6a	Bridge selection common
7	Connect 4 & 7 for onboard voltage adjustment. Connect 10K ohm VR to 6a & 7 for external voltage adjustment. (keep 4 & 7 open)
8	No use (Null)
9	Connect 9 & 6a for 3 phase sensing connect. Keep 9 & 6a open for single phase sensing
20	Single or Three phase sensing input
22	Single or Three phase sensing input
24	Three phase sensing input Connect 22 & 24 for Single phase sensing input
26	Three phase power input
28	Single or Three phase power input
30	Single or Three phase power input
F1	Positive excitation output (+)
F2	Negative excitation output (-)

SECTION 5 : WIRING CONNECTIONS

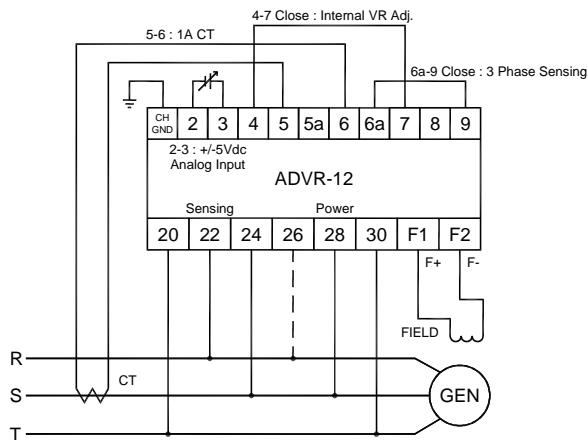


Figure 3 Three Phase Sensing SHUNT

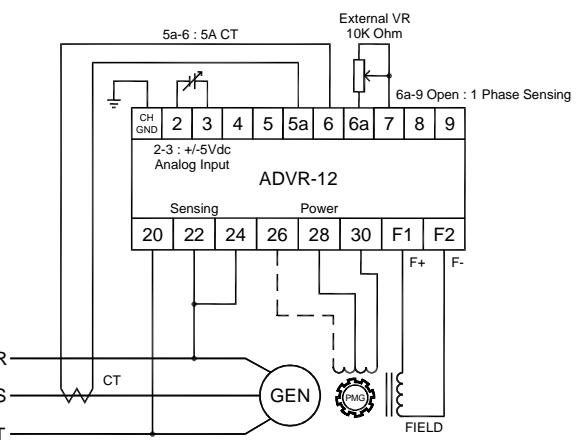


Figure 4 Single Phase Sensing PMG or Auxiliary Winding

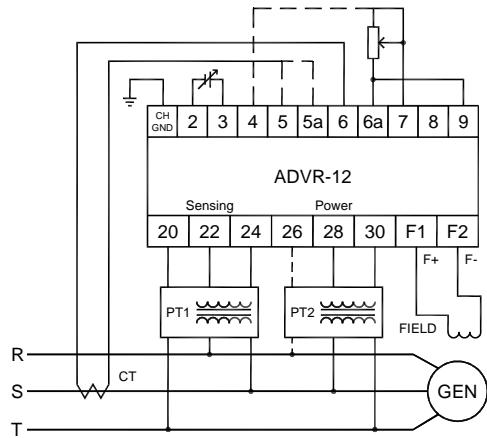


Figure 5 Three Phase Sensing with power transformer
(If sensing or power voltage differs from ADVR-12, add PT1 or PT2.)

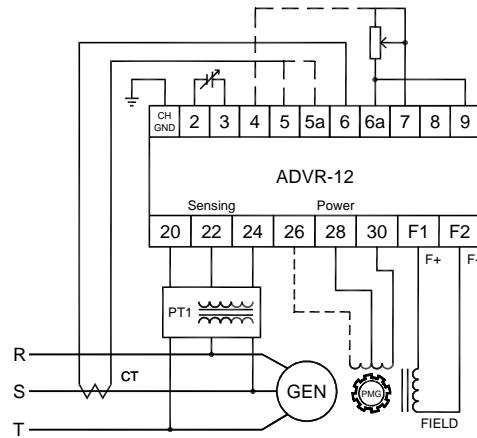


Figure 6 PMG or Auxiliary Winding with power transformer
(If sensing voltage differs from ADVR-12, add PT1.)

ATTENTION

1. All AC voltage readings are average value only.
2. When setting external VR (open 4-7), the Internal VR will be invalid.
3. External voltage regulator: 10K ohms, 1 watt. Adjustable range is the same "VOLT" range.
4. Sensing Voltage can be set from 220 – 440 Vac Program SW5 correctly.
5. For single phase sensing bridge 20 & 22 and open 6a & 9.
6. When using PT1 of capacity >100VA, must pay attention that the voltage and capacity of transformer PT2 has adequate excitation output.

- ※ Use only replacement fuses specified in this user manual.
- ※ Appearance and specifications of products are subject to change for improvement without prior notice.